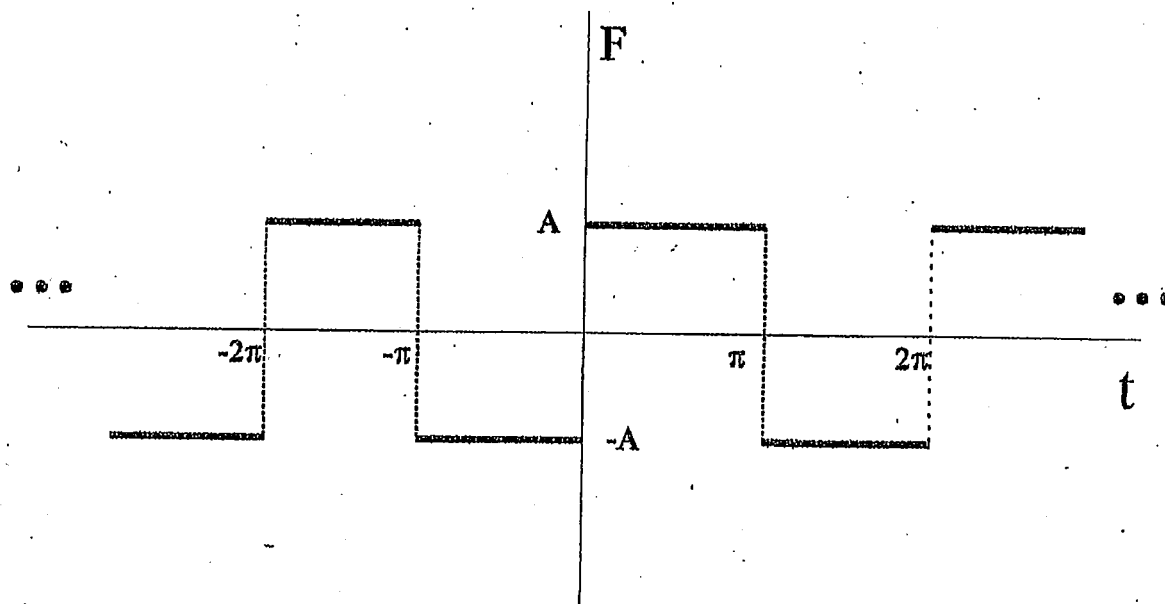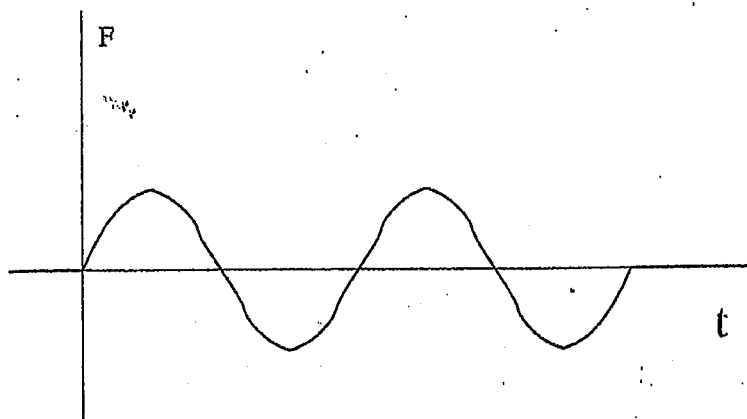# Physics 105A
Problems due Oct. ~~2~~ 1

AP3. A block of mass m is attached to a spring with force constant k; the damping coefficient is β. The driving force $F(t)$ (which is graphed below) is periodic with period (2π); it is given by $F(t) = -A$ for t from $-\pi$ to 0, and $F(t) = +A$ for t from 0 to $+\pi$, where A is a constant. Write the series expression for the particular solution $x_p(t)$.

AP4. Again, mass m, force constant k, but this time $\beta=0$. The block is at rest for $t<0$; then a driving force is applied. For some integer n, the driving force is given by

$$F(t) = A\sin(\omega_0 t) \text{ for } 0 < t < \tfrac{2\pi n}{\omega_0}; \quad F(t) = 0 \text{ for } t > \tfrac{2\pi n}{\omega_0}. \quad \text{where (as usual) } \omega_0 = (k/m)^{\frac{1}{2}}$$

For example, for $n = 2$, F looks like this:

Find $x(t)$ for $t > \dfrac{2\pi n}{\omega_0}$